No. III.—ON A NEW LAND-LEECH FROM THE SEYCHELLES.

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(Plate 6 and 1 Text-figure.)

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The four specimens of a land-leech brought back by Professor Stanley Gardiner from the Seychelles are the first examples of Hirudinea to be recorded from these Islands.

This species not only proves to be new, but possesses unusual features which, if not singly, at least collectively justify the establishment of a new genus: it is worthy of note also on account of its habitat, for although its restriction to such situations seems improbable, the individuals so far obtained have to be added to the list of fauna found in the moist humus which accumulates in the hollow leaf-bases of *Pandanus* and palm *.

Terrestrial leeches fall into two groups. Of one of these *Trocheta*, a form not unknown in England, may be taken as the type. It comprises several genera of Herpobdellidæ of carnivorous habit, with toothless, more or less vestigial jaws, which prey for the most part upon earthworms.

It is another group however, the Hæmadipsinæ, whose members are usually indicated by the term "land-leech," and to it the new form from the Seychelles is to be referred.

This includes a number of voracious, blood-sucking parasites, typical of which is *Hæmadipsa zeylanica*, so familiar to the traveller in the hilly parts of India and Ceylon. The Hæmadipsinæ are essentially an Oriental group, although represented by several more or less aberrant genera in other regions of the globe.

In all, seven well-established genera have been recognised hitherto; they all affect considerable altitudes and are conspicuous by their absence from Madagascar and Africa.

Of these genera, *Hæmadipsa* (Tennent, 1861) multiplies exceedingly throughout the Oriental region; it ranges as far north as Japan, as far east, it is said, as New Guinea and the Pelew Islands, and probably requires further sub-division; *Xerobdella* (von Frauenfeld, 1868) occurs in the South Austrian Alps; *Mesobdella*, a form having affinities with the Glossosiphonidæ, is found in Chile and was first described by Professor R. Blanchard in 1893; the same authority has recorded (1894 and 1897) *Phytobdella* from the Philippines and Moluccas and *Planobdella* (1897) from Celebes; *Moquinia* (R. Blanchard, 1888) and *Philæmon* (R. Blanchard, 1897) are confined to Australia and

* Cf. R. C. Punnett, "On an *Arboricolous Nemertean* from the Seychelles." Trans. Linn. Soc. Ser. 2, Zool. xii. (1907), p. 57.

Tasmania and differ from the rest in the possession of but two jaws, a peculiarity shared by *Idiobdella seychellensis*.

The appearance of a new species possessing this remarkable characteristic of the Australian land-leeches renders advisable the sub-division of the Hæmadipsinæ into the following two series:

Series 1. *Trignathoferæ.* With three jaws, one supero-median and two infero-lateral. The bite inflicts the familiar Y-shaped incision.

Including the genera *Hæmadipsa*, *Xerobdella*, *Phytobdella*, *Planobdella* and *Mesobdella*.

Series 2. *Duognathoferæ.* With two jaws, the supero-median member being absent. The bite inflicts a nearly straight cut.

Including the genera *Moquinia*, *Philæmon*, and *Idiobdella* (described below).

It is to *Moquinia*, with its typical or "complete" somite formed of five rings that *Idiobdella* is most nearly related, since the "complete" somite in *Philæmon* is but four-ringed.

[*Moquinia* is synonymous with the *Geobdella* of Whitman, 1886. The latter name however, having been applied by de Blainville to *Trocheta* in 1828, justified the proposal of the former name by R. Blanchard in 1888*. The first adequate description of the Australian land-leeches was given by Miss Ada M. Lambert in 1897, 1898†.]

After the number of the jaws, the most striking character presented by *Idiobdella* consists in the position of the genital orifices.

Apáthy (1888) laid it down as an axiom that in all leeches the male opening occurs in somite XI and the female in somite XII (somites X and XI, as counted by Whitman), but it would have been more correct to have stated that these orifices occur within the limits of these somites, since in *Helobdella stagnalis* the genital ducts open by a common pore between them.

Even now, however, this statement admits of an exception, for in *I. seychellensis* the male opening is situated in somite X and the female in somite XIII, an occurrence unique among leeches.

The reproductive organs in the new species do not differ materially from those of *Philæmon* and *Moquinia* except in regard to the testes. Of these, only nine pairs exist in *I. seychellensis* and the reduction has taken place anteriorly; the anterior pairs show a marked and progressive diminution in size, whilst the pair corresponding to the foremost pair in allied species is absent.

The female apparatus as a whole, and also the much coiled epididymes, are bulky in comparison with the size of the animal, and this probably bears some relation to the unusual position of their respective external openings.

* Article "Hirudinea" in Dictionnaire Encyclopédique des Sciences Médicales, Paris, 1888.

† "The Structure of an Australian Land Leech" (*Philæmon*), Proc. Royal Soc. of Victoria, Vol. x. (1897), p. 211; also "Description of two new Species of Australian Land Leeches" (*Geobdella*), loc. cit. Vol. xi. (1898), p. 156.

The "posterior organs" described by Miss Lambert as well developed in *Philæmon* and less conspicuous in *Moquinia*, were not observed in *I. seychellensis*, though it is not impossible that they may be detected in fresh material more favourable for examination.

Somite VII comprises four rings instead of three, as in *Hæmadipsa* and *Moquinia*, and the nephridiopores begin in the last ring of this somite and so differ as regards the position of the first pair from the arrangement described by Miss Lambert in the Australian land-leeches; again the ear-like lobes, termed "auriculæ" by Blanchard, which overhang the posterior pair of these pores in most of the Hæmadipsinæ and form a characteristic feature, are absent in *Idiobdella*.

I now proceed to give a brief diagnosis of this new genus and of the single species upon which it has been founded.

Idiobdella, gen. nov.

[ἴδιος strange, peculiar; βδέλλα, leech.]

Hæmadipsinæ with two denticulate jaws. Complete somite formed of five rings. Without auriculæ. No genital apertures in somites XI and XII.

Idiobdella seychellensis, sp. n.

The body of this little species has a rough or granular appearance due to the presence of small, closely-set papillæ disposed transversely on the rings. Posterior sucker small and not wider than the widest part of the body.

Colour (after immersion in alcohol) in three individuals fawn, in the fourth brown, uniform above and below. The dorsal surface is traversed by three deep brown longitudinal stripes; two paired rows of large papillæ are conspicuous upon the ventral surface, a pair of papillæ occurring in each "complete" somite upon the third ring.

Five pairs of eyes situated respectively on rings 2, 3, 4, 5, and 8.

Rings, 97. Somites I—IV uniannulate, V and VI triannulate, VII with four rings, the fifteen somites VIII—XXII "complete" with five rings, XXIII with four rings, XXIV—XXVII uniannulate.

Anus perforating the groove which separates the last ring from the posterior sucker.

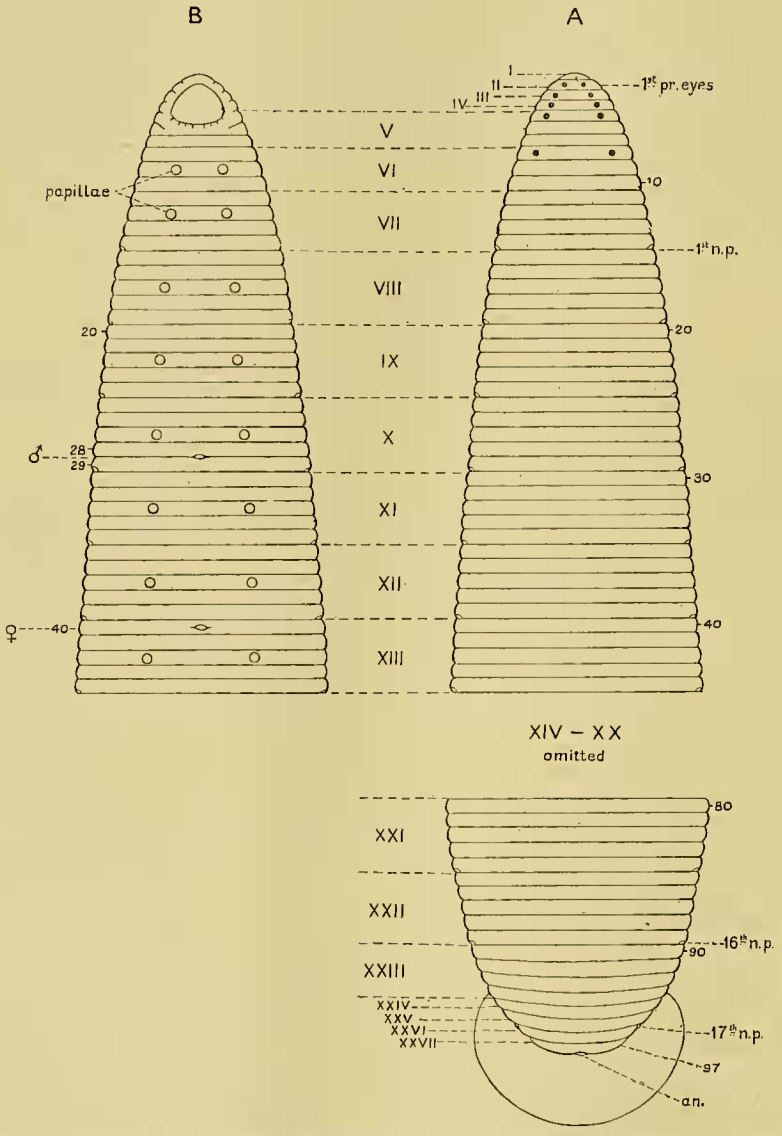
Nephridia, 17 pairs. The nephridiopores occur, as is usual, in the marginal lines of the body, and on the posterior edge of the rings which they pierce; the first pair open on the posterior part of ring 14 (the last ring of somite VII); the last pair lie between somites XXV and XXVI, whilst the 16th and 17th pairs are separated by six rings, instead of five as in the case of the other pairs.

Genital apertures separated by eleven and a half rings, the male orifice being situated between rings 28 and 29, that is to say, between the fourth and fifth rings of somite X; and the female orifice lying upon ring 40, namely, the first ring of somite XIII.

Size. The four examples (in alcohol) were in a fairly well extended condition and were measured with the following results: No. 1, 13 mm. long and 2·25 mm. wide; No. 2, 12·50 mm. long and 2·50 mm. wide; No. 3, 9 mm. long and 2·50 mm. wide; No. 4, 11·50 mm. long and 2·25 mm. wide.

Localities. Three specimens "from fallen and decaying leaf-base of palm in very damp place, 1500 feet, Silhouette Island, Seychelles," the fourth specimen "from a *Pandanus* leaf-base, above Mare aux Cochons, Silhouette."

Several issues, not wanting in interest, are raised by the discovery of *Idiobdella seychellensis*.



Idiobdella seychellensis. Diagram of (A) dorsal and (B) part of ventral surface, showing eyes, annulation and external openings. Somites numbered in Roman, and rings in ordinary figures. n.p., nephridiopores; an., anus.

In the absence of any evidence supporting the view that this species and the other members of its Series are survivors of a type more primitive than that possessing three jaws, we may assume, with more than a fair share of probability, that the Duognathoferæ are derived from some form not far removed from *Hæmadipsa*, and are led to enquire by what means the loss of the supero-median jaw was brought about.

The Gnathobdellidæ present a fairly complete series of forms ranging from typical

blood-sucking species with fully armed jaws to those of carnivorous habit in which these features are more or less vestigial or even absent.

Whatever interpretation be placed upon this scale of facts, whether it be read upwards or downwards, one conclusion is the same: the change to which it bears witness has been a gradual one.

But no intermediate stages are known to exist between the Trignathoferæ and the Duognathoferæ, and it seems, therefore, not unreasonable to suppose that the disappearance of the third jaw occurred suddenly; in short, that we have here an instance of mutation.

Again it is difficult to understand how the presence of only two jaws, capable of making a wound one-third less in size than that inflicted by three jaws, can be of any benefit to a blood-sucking parasite and the doubt is increased by a consideration of the comparative scarcity of the species provided with the lesser armament and the enormous multiplication of the three-jawed forms.

The mutation, then, has not been to the advantage of the race and the Duognathoferæ are to be regarded as one of Nature's unsuccessful experiments.

We know little, however, of the anatomy, still less of the distribution, and nothing at all of the embryology of many of the known species of Hæmadipsinæ; other forms probably await discovery, and further speculation seems idle in the present state of our knowledge.

In conclusion, *Idiobdella seychellensis* is not merely at a disadvantage in respect of its armament. In the only island in which it has so far been found there are no terrestrial warm-blooded animals upon which it can prey and it probably sucks the blood and juices of earthworms and other soft-bodied invertebrates.

It is the smallest of the Hæmadipsinæ and its diminutive size, its reduced number of testes, its lack of auriculæ, and its extreme scarcity substantiate the view that it is a degenerating species in process of extermination.

EXPLANATION OF PLATE 6.

Fig. 1. *Idiobdella seychellensis*, from a specimen preserved in alcohol, dorsal view. × 4.

Fig. 2. The same, ventral view. × 4.

Fig. 3. The same, dorsal view of head region, showing the eyes. × 16.

Fig. 4. The same, dorsal view of posterior extremity. × 16.

Fig. 5. Ventral view of anterior region. The anterior sucker and part of the body posterior to it have been slit up by a median incision exposing the two jaws. Greatly enlarged. *ce.* cut edge of body wall; *pe.* entrance to pharynx; *j.* jaw; *s.* interior of sucker.

Fig. 6. Reproductive organs. Greatly enlarged. The parts, which originally were tightly packed together, have been opened out for the sake of clearness and the posterior pairs of testes are omitted. *ps.* penis sac; *ep.* epididymis; *v.d.* vas deferens; *t* 1, *t* 2, *t* 3, first, second and third pairs of testes; *ov.* ovary; *p.ovd.* and *c.ovd.* paired and common oviducts; *v.* vagina; *vg.d.* vaginal duct to exterior.